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## Specification

Paragraph at page 5, line 29 - page 6, line 13:

The techniques of the present invention may be implemented in the form of instructions stored in a memory and executed by a general purpose microprocessor present in a desktop computer, laptop computer, viedo video arcade game, and the like. The techniques of the present invention may also be implemented in hardware, i.e., using an ASIC that is part of a computer system. The synthesized signals from the microprocessor or ASIC are output to a user using an audio sound system that is either internal to the system or part of an external sound system connected to the computer system. The hardware preferably includes conventional state-of-the-art components well known in the art. Because the primary distinguishing features of the present invention relate to the specific synthesis techniques, the following description will focus on these techniques.

Paragraph at page 10, line 15 - page 11, line 9:

After the trigger process generates an event, the algorithm passes tot he to the parameter selection. An exemplary embodiment of the parameter selection component of the invention is illustrated in the block diagram of FIG. 4. Four different parameters are shown; however, any number or types of parameters is within the scope of the present invention. The parameter selectors shown are wave selection, pitch distribution, pan (i.e., left-to-right sound movement) distribution, and amplitude (i.e., loudness) distribution. Each parameter selector is implemented as a Gaussian distribution with independently selectable mean and standard deviation, as well as fixed

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values. In operation, the user seminimum and maximum lects desired values of the mean, standard deviation, minimum, and maximum for each parameter or for a subset of the parameters. Each time an event is generated by the trigger process, each parameter selector chooses a random parameter value according to its distribution. parameter value does not fall within the limits set by the fixed minimum and maximum, then a new value is chosen according to the same distribution until a value inside the preset limits is found. Thus each module has an effective distribution equivalent to the original distribution with the intervals outside the limits set to zero (and renormalized). the The chosen parameter values are then applied to the wave chosen by the wave selection process.

Paragraph at page 11, line 22 - page 12, line 24:

In an alternative embodiment, the inputs standard deviation, minimum, maximum) to the parameter selector distributions are varied in accordance with the variation in the trigger process intensity parameter. This is particularly useful in cases where the wave selection or pitch distribution should shift as the intensity changes. Returning to the car crash example, highintensity events at the beginning of the car crash should be crunch sounds, while lower-intensity events at the end of the car crash should be higher-pitched glass breaking sounds. FIG. 5A illustrates one possible implementation. A simple linear transformation or lookup table is applied to he to the intensity envelope to obtain inputs for the parameter selectors. The intensity envelope can be used to control some or all of the mean, standard deviation, minimum, and maximum values input to the parameter selecAppl. No. 10/040,653 Amdt. dated June 22, 2005

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tor. It can also be used to control some or all of the parameter selectors. The user can choose which inputs and which parameters depend upon the intensity envelope. The transformation applied to the intensity envelope can vary for the different inputs and parameters. Alternatively, as shown in FIG. 5B, envelope generators create separate time envelopes from the intensity envelope. These time envelopes are then applied to each parameter or each input to control the time dependence of the parameter. The parameter selector inputs can also depend upon events occurring within the game. As with the above example in which the trigger intensity changes after a goal scored, the types of waves generated can change after an event occurs. This can be implemented by changing the minimum and maximum inputs to the wave selection process. Similarly, parameter values applied to the selected wave can also change in response to a particular game occurrence.

## Paragraph at page 12, line 25 - page 13, line 13:

Finally, the playback engine generates sound according to the selected parameters. The playback engine is wavetable synthesizer preferably a such (downloadable sound) unit generator containing samples appropriate to modeling a complex event. In the DLS unit generator, sounds from wavetables are downloaded inot into specific memory locations corresponding to specific program change numbers. Parameter implementation is preferably through standard controls within the playback engine. For example, in the DLS unit generator, pitch control is via a keyNum control, amplitude control is via a velocity control, and pan control is via a pan controller. Wave selection is via selection of program change,

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provided that each sound sample has a unique program change number. In a standard DLS synthesizer, the keyNumto-pitch mapping is hardwired at one semitone-per-keyNum, and thus there tends to be an unintended musical sound, especially if the waves are strongly pitched. If desired, finer pitch control can be implemented using the pitchBend command.